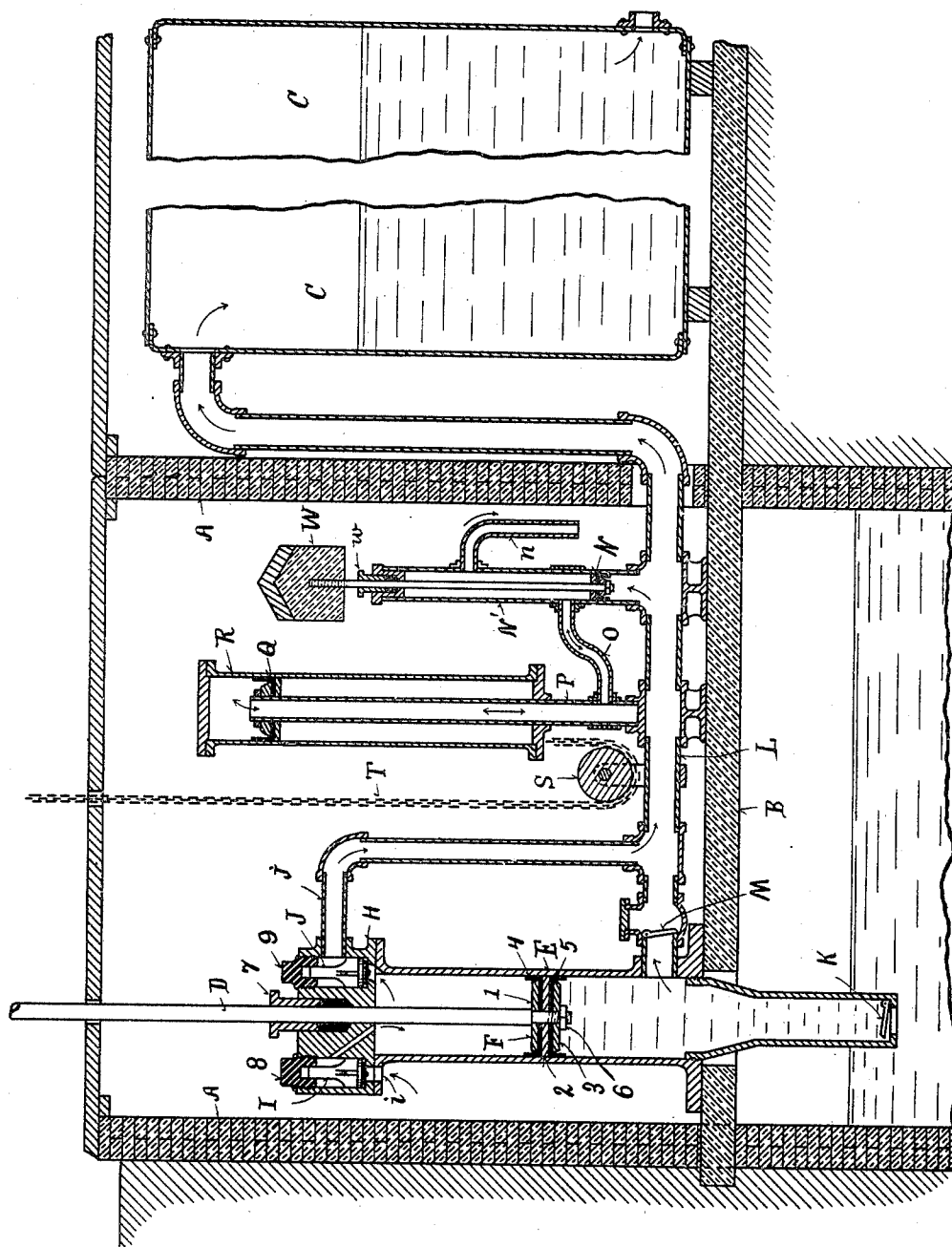


(No Model.)

L. DUNN & C. C. HAWLEY.
HYDRAULIC PUMP.

No. 600,195.

Patented Mar. 8, 1898.



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UNITED STATES PATENT OFFICE.

LOUIS DUNN AND CHARLES C. HAWLEY, OF NEW PARIS, OHIO.

HYDRAULIC PUMP.

SPECIFICATION forming part of Letters Patent No. 600,195, dated March 8, 1898.

Application filed September 12, 1896. Serial No. 605,597. (No model.)

To all whom it may concern:

Be it known that we, LOUIS DUNN and CHARLES C. HAWLEY, residing at New Paris, in the county of Preble and State of Ohio, have invented certain new and useful Improvements in Hydraulic Pumps, of which the following is a specification.

The object of our invention is to provide means for automatically regulating the pressure of a power-pump which is employed to store water in a tank or reservoir; also, to automatically engage and disengage the pumping mechanism.

Another object of our invention is to provide improved mechanism for aerifying the water under pressure and thereby furnishing an air-cushion for the reservoir-tank.

The features of our invention are more fully set forth in the description of the accompanying drawing, making a part of this specification, in which the figure is a central vertical longitudinal section of our improvement.

In the preferred form of construction the pump and regulating devices are connected together and adapted to be mounted upon a platform. They are so constructed that they may be set in the mouth of the well below freezing-point.

A represents the walls of the well.

B represents a platform suspended below the surface a sufficient distance to be below the freezing-point.

C represents the storage-tank.

E represents the power-pump cylinder; D, the piston-rod.

F represents the piston. It is composed of three disks 1 2 3 and cup-packings 4 5, secured together between said disks by the clamp-nut 6.

H represents the cylinder-head. 7 represents a stuffing-box secured therein.

8 9 represent caps in the cylinder-head in which the air-valves I J are seated. Valve I, when it rises, admits air through the passage into the pump-cylinder, and on the return or up stroke the valve J rises and air is forced through the pipe j, tapping the supply-pipe L, leading to the reservoir.

K represents the check-valve at the lower end of the pump.

M represents a check-valve in the supply-pipe L. The automatic regulating devices

are connected to the supply-pipe L and consist of the weighted piston N, working in the cylinder N', provided with outlet-pipe n, weight W, mounted on the piston-rod, w representing the stuffing-box in said cylinder N'.

O represents a pipe connecting cylinder N' with the piston-pipe P. On the top of this is mounted a piston Q.

R represents the working cylinder which travels on the piston-pipe P.

S represents a pulley, over which passes the shipping-chain T. This chain is attached to a windmill or other power device, so arranged as to be normally in gear, and it is unshipped by the pulling down of said chain. The lower end of the chain is attached to the cylinder R.

Mode of operation: The piston-rod D is operated by the power-driving mechanism and forces water through pipe L into tank C. The weight W, supported upon the piston N, determines the pressure against which the pump operates, more or less weight being added to regulate the same. This weight is sufficient to resist sixty pounds of pump-pressure. When the pressure rises above this, piston N will rise, uncovering pipe O. The water will pass through said pipe, through the hollow piston P, into the upper portion of the cylinder R, discharging through the piston Q. This pressure raises cylinder R, which pulls down the chain T and unships the power mechanism. As the pressure decreases in said tank the piston N will descend and the water from the upper portion of cylinder R will escape through the hollow piston-rod P, pipe O, cylinder N', and waste-pipe n. This allows the cylinder R to descend and the power mechanism is automatically brought into gear. In the operation of the pump air is supplied with the water through the valves I J and an air-cushion is maintained in the reservoir at all times. The construction and arrangement of these valves are important, as the weighted valves are employed, and they are therefore sensitive. They are seated in the caps of the cylinder-head, and they can be taken out and put in without interfering with the pipes or disturbing any portion of the mechanism. By employing the weighted piston in combination with the regulating-cylinder R and the waste-pipe n a very sensitive regulation is obtained

and a very nearly uniform pressure is maintained in the tank. These parts are simple in construction, convenient in location, and very durable; but each part is readily accessible for the purpose of repairing the stuffing-box, pistons, and valves.

By the construction and arrangement of parts herein shown and described we are able to control the operation of the pump by the variation of pressures upon the weighted piston N, avoiding the necessity of using tripping-valves controlled by a float in the tank. The weight W and the pressure on the piston N automatically control the shipping mechanism. The regulating-cylinder R is journaled upon the hollow stem P, which, with the piston Q, serves to steady the movements of the cylinder and allows the shipping chain T, passing over pulley S, to be attached directly to the bottom of the cylinder. The pipe *j* and valves I J constantly supply air to the supply-pipe L and keep the reservoir or storage-tank C supplied with air sufficient to cushion the movements of the column of water under the varying pressures, which thus enables us to use the weighted piston alone to determine and control the pressure at which the shipping and unshipping shall be accomplished. We obtain a material advantage by employing a weighted piston and a cylinder operated by gravity, as the resistance of the weight is constant, whereas the pressure of a spring is variable and not nearly so sensitive as the devices we employ.

It will be noticed that by the indirect connection between the weighted piston and the power-disconnecting mechanism variations of pressure to a considerable extent can be controlled by the weighted piston without in any way operating the disconnecting mechanism. Thus the ordinary water-hammer is prevented without stopping the power mechanism, and the operation of the pump is controlled by the pressure in the pipes, irrespective of the height of the water in the reservoir. An additional advantage of our construction is that in case anything should happen to prevent the operation of the disconnecting device the weighted piston will rise and the pressure be relieved through the pipe *n*.

Having described our invention, we claim—

1. In combination with a power-pump and closed reservoir, a supply-pipe leading from the pump to the reservoir, a stationary cylinder tapping said pipe, a weighted piston traveling in said cylinder, an escape-pipe tapping said cylinder above the normal path of travel of said piston but below the limit of its motion, a supply-passage leading from the lower portion of said cylinder in the line of the piston travel and tapping the stem of a hollow piston supported on said stem, a regulating-cylinder normally mounted on said piston and stem and a shipping-chain connected thereto, substantially as described.

2. In combination with a power-pump and closed reservoir having a pipe leading from the pump to the reservoir, a stationary cylinder tapping said pipe, a weighted piston in said cylinder, an escape-pipe tapping said cylinder above the normal path of travel of said piston but below the limit of its movement, a pipe tapping said cylinder in the line of the piston travel and tapping the hollow piston-stem P, a piston mounted on said stem, a regulating-cylinder normally mounted on said piston and stem, a shipping-chain T and pulley S connected and combined, substantially as described.

3. In combination with a power-pump and closed reservoir having a supply-pipe leading from the pump to the reservoir, the stationary cylinder N', the weighted piston N traveling therein, an escape-pipe tapping said cylinder above the normal path of travel of the piston but below the limit of its motion, the supply-pipe O connecting said cylinder with a hollow valve-stem P, the piston Q, the moving cylinder R, the shipping-chain T and the air-pipe *j* tapping the said supply-pipes between the piston N and the pump, the valves I, J, secured in the pump-cap for supplying air to said supply-pipe and reservoir, substantially as described.

In testimony whereof we have hereunto set our hands.

LOUIS DUNN.
C. C. HAWLEY.

Witnesses:

F. S. RICHEY,
C. M. SHORT.